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ABSTRACT

The impact of instructional television and educational reform in El Salvador was apparent in the 1969 school year. Large gains in learning were recorded for each of the three televised seventh-grade courses--science, mathematics and social studies. Baseline tests administered in four grades of school revealed that urban students developed conceptual abilities more quickly than rural students. Tests of general and reading ability were given to large samples of school children and here again urban students led rural students, and boys led girls. Overall attitudes were highly favorable toward the new educational innovations. Teachers and students who used instructional television were quite favorable at the beginning of the experience and even more favorable at the end. Three quarters of the research sample of seventh-grade students showed they were aspiring to higher status careers and higher salaries than their parents. And one final conclusion that emerged strongly was the importance of thorough planning and preparation before a new system goes into the classroom. (MG)

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TELEVISION AND EDUCATIONAL REFORM IN EL SALVADOR

SUMMARY REPORT OF THE FIRST YEAR OF RESEARCH

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RESEARCH REPORT NO. 3

This is one of a series of reports of research on the Educational Reform Program of El Salvador, and especially its use of instructional television. This report has been prepared by members of the Institute for Communication Research, Stanford University, on behalf of the Academy for Educational Development, under contract with the U.S. Agency for International Development.

MAY, 1970

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Research and Evaluation Reports on the El Salvador Educational Reform and Television Project published by the Institute for Communication Research, Stanford University, Stanford, California:

1. First Meeting of the Advisory Committee. Administrative Report No. 1. October, 1968.

2. Design of the Study. Research Report No. 1. December, 1968.

3. The Use of Television in the El Salvador Program of Educational Reform: Differences between This Project and Some Others. Administrative Report No. 2. April, 1969.

4. The El Salvador Educational Reform: Some Effects of the First Teacher Retraining Course. Research Report No. 2. July, 1969. By Emile G. McAnany, Generoso Gil, Jr., Donald F. Roberts.

5. Measuring Educational Development through Classroom Interaction. Research Memorandum No. 1 September, 1969. By Wilbur Schramm.

6. Parents Talk about ETV in El Salvador. Research Memorandum No. 2. October, 1969. By Luis F. Valero Iglesias, Emile G. McAnany.

7. "Feedback" for Instructional Television. Research Memorandum No. 3. December, 1969. By Wilbur Schramm.

8. Research and Evaluation in the El Salvador Project of Educational Reform: What Is Being Tested and Why. Research Memorandum No. 4. January, 1970.

9. Research and Evaluation in the El Salvador Project of Educational Reform: Some Preliminary Research Findings from the First School Year, 1969. Research Memorandum No. 5. February, 1970. By Emile G. McAnany.

10. Television and Educational Reform in El Salvador: Summary Report of the First Year of Research. Research Report No. 3, May, 1970. By Wilbur Schramm, Emile G. McAnany, John K. Mayo, Robert C. Hornik.

11. Television and Educational Reform in El Salvador: Complete Report on the First Year of Research. Research Report No. 4. July, 1970. By Emile G. McAnany, Robert C. Hornik, John K. Mayo.

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The 1969 school year -- February to November -- was the first one in which the impact of El Salvador's educational reform, including a new curriculum, retrained teachers, and instructional television, was felt in the schools. This is a summary report of research findings on that first year. Results in detail will be available in a larger report, to be published about July 1.

Most of the research concerned itself with 48 seventh-grade classes, 32 of which had the new system complete with TV, four of which had all new elements but without TV, and 12 of which were the regular traditional classes.

In brief, the main findings are as follows:

Learning: Large gains in learning were recorded in each of the three televised courses -- science, mathematics, and social studies -- where results were measured. No standardized norms are available by which to interpret these gains but they were about 20 per cent larger than the gains in the same subjects taught in the traditional way without television, when the old and new courses were compared on questions applicable to both curricula. An attempt was made, by means of an experimental design, to try to separate the effect of television from that of other elements in the system, but results were inconclusive. Moreover, everyone in television classes, whether rich or poor, from the city or country, male or female, with high ability or not so high ability, gained more or less the same number of points on the learning tests. There were fears that television instruction would be non-egalitarian in its successes; that only children in the cities, or children of well-educated parents would benefit from it. From our first year of research, we have strong evidence that this is not so.

Effect on patterns of thinking: Cognitive tests were given in four grades of the El Salvador schools in order to establish baselines against which to measure, after a suitable interval, the effect of the new system on the development of patterns of thinking.

These initial tests reveal that students in urban schools develop considerably more quickly than rural students an ability to relate objects and words in terms of their functions rather than merely their appearance; and also that urban students earlier than rural students, boys earlier than girls, develop the ability to think flexibly and imaginatively about new concepts. These differences must be due in part to the background of the students, in part to what happens to them in school. Therefore, the important questions to be examined in future years are whether the new educational system will speed this process of cognitive development, and whether, by providing greater equality of opportunity, it will narrow the differences between groups.

Abilities: Tests of general ability and ability to read, prepared for Spanish-speaking populations, were given for the first time to large samples of Salvadoran schoolchildren. Considerable differences were found by the time children had reached the seventh grade, in favor of urban students over rural students, boys over girls. The sex difference may be due largely to what the culture expects of boys as compared to girls; the urban-rural difference may reflect the difference in teachers and educational opportunity as well as family background. These tests will be repeated each year to measure gain over the three years of Plan Basico (grades 7-9) in television and traditional classes.

Attitudes: Overall, attitudes were highly favorable toward the new system and toward instructional television. Teachers and students who actually taught or studied with television were quite favorable at the beginning of the experience, even more favorable at the end. One effect of teacher retraining was to bring about a more informed, more realistic viewpoint about television. Teachers in retraining both from the primary and secondary normal training schools who had not actually taught with television, were also favorable but more skeptical. Teachers and students in traditional classes, without television, were less favorable than those in the new system, but they became more favorable during the school year, suggesting that they may have heard good reports of the new system.

Aspirations: Three fourths of Plan Basico students in our sample have already had more education than their parents by seventh grade, and are aspiring to higher status careers and higher salaries than their parents. A very large number are aiming toward higher education and professional occupations. This may be a development that will lead to future problems, considering El Salvador's limited ability to provide university education and professional training for large numbers.

Classroom interaction: Preliminary studies of what actually happens in classrooms under the new and the old systems indicate that

the new system classrooms are likely to be visually more interesting, intellectually more challenging, than classrooms in the old system, and likely to depend less on rote learning and lecturing, more on the student's own learning activities.

History of the project: For guidance of other countries contemplating major changes in their educational systems, and especially the use of instructional television, records are being kept of the development of this project, and the problems that occur. These must be interpreted, of course, with greater perspective than is now possible, but one conclusion that emerges strongly is the importance of planning and preparation before the new system actually goes into the classroom. The roots of the El Salvador project reach back several years, and six months before the first classroom broadcast staffs were already at work and activity was under way in every aspect of the new system.

Television and educational reform in El Salvador

The present educational reform in El Salvador was first conceived as little more than the placing of a television receiver in each classroom. As plans developed, however, and as the full implications of the introduction of new technology became clear, it was seen that television was not only an innovation important in its own right, but also a catalyst of change that would affect every aspect of education in El Salvador.

Thus, for example, it was evident that instructional television could distribute poor teaching as readily as excellent teaching, outdated subject matter as readily as the newest subject matter. Therefore, the introduction of ITV called for some special attention to the content and method of teaching. El Salvador met this challenge with a major curriculum revision that began in the year before television, and is still continuing.

Furthermore, a new curriculum would require classroom teachers

to handle new dimensions of subject matter for which many of them would not be prepared; and the responsibility of teaching in a "team" with the television teacher would require some rethinking of teaching techniques and a change in the rote methods which had been used in many Salvadoran classrooms. Therefore, El Salvador created a new central normal school, and provided that every classroom teacher would have substantial retraining (three months for the first group of teachers, a full year for each later group) before teaching the new curriculum. The unfamiliar demands of teaching new subject matter, and teaching with television, called for new classroom materials, for teachers as well as for students. The need to help teachers work into their new role resulted in a different concept of supervision, so that supervisors were selected and prepared to be advisers rather than inspectors.

The needs of studio teachers, producers, and programmers called for a new system of "feedback" reports by which classroom teachers could contribute continuously to the design and planning of lessons. The need to broadcast a given course to the entire school system at the same time made it necessary to move away from the old system of "taxicab" teachers, which permitted one teacher to spend an hour teaching at one school, hurry to another to teach the same course for another hour, hurry to a third one, and so on; now the teachers under the Educational Reform are assigned to one school, where they are more easily available to their students.

The need to keep track of the results of the new curriculum,

and especially of the televised teaching, provided the incentive to begin some common testing, which had not previously been customary in El Salvador, and also to establish a program of research and evaluation. And finally, the introduction of a new system and large units of personnel devoted to televised teaching and curricular revision, provided additional reason to reorganize the educational structure, beginning with the Ministry of Education itself.

Educational reform in El Salvador is thus a system-wide change. Instructional television is only one element, although a very influential one, in the changes that are taking place. El Salvador has learned from the experiences of other countries and has moved forward with a very broad and sophisticated concept of how television can be used for instruction. This makes the program of educational reform especially worth studying. The work of the first year's research was to record, as much as possible, the start of these changes. Future research will chart their development as the Reform spreads throughout the school system.

A note on the students and their expectations

More than 50 per cent of the children in El Salvador who enter the first grade do not get past the second grade. Only about 17 per cent of those who originally entered school reach Plan Basico (seventh, eighth, ninth grades). These were the enrollment figures for the 1969 school year:

Primary school (first through sixth)	517,000
Secondary school (seventh through twelfth)	85,000
University	7,500

The selective process that goes on throughout the system therefore insures that each higher level of schooling will be restricted to an increasingly "elite" group, although this may be defined more on the basis of family income, parental education, and urban residence, than on the basis of native ability. Just as education takes nearly 30 per cent of the El Salvador national budget, so does the cost of educating children represent a major expense for families in a country where the average income is only about $250 a year.

El Salvador decided, after studying its educational needs, to begin the program of educational reform with Plan Basico. In 1969 it tried out the new system in 32 seventh-grade classes. This year it has expanded the program to cover 80 per cent of all public school seventh-grade classes (110 schools, about 11,000 students), and is trying the new eighth-grade curriculum on the 32 eighth-grade pilot classes. Thus in four years the new system will cover all of the public Plan Basico schools, and will move into the primary and the higher secondary cycles. It should be added that in 1969 46 per cent of all Plan Basico students were in private schools, most of which follow the national curriculum, all of which are encouraged to make use of the instructional television if they will provide their own receivers and maintenance, and many of which do that. A small sample

of private school students using ITV was also studied as part of the first year's research.

It is not surprising that the seventh-grade public school students, who have been the chief subjects of study this year, should be an elite group in comparison to their peers who are not in school. A signal of higher-than-average family income is that 44 per cent of them claim to have a television set in their home. This figure is far above all estimates of the El Salvador average.

Not only do these students represent a special group among their peers, but they form a distinct group when compared with their parents. In education, for example, they have already far outstripped their parents as Table one shows:

TABLE ONE

Distribution of Level of Parents' Education: Total Sample

Level of education achieved	Father's education	Mother's education
Without primary	13%	16%
Part of primary	32	36
Finished primary	28	32
Plan Basico	12	6
Short Course (commercial)	10	8
Bachillerato (univ. prep.)	4	2
University	1	0

Inasmuch as only about 17 per cent of their parents hold jobs that demand more than primary education, it is interesting to note that these young people are aspiring far beyond their parents' own career and salary status. A large portion of these students are aiming at professional careers. Some idea of the asymmetry between parents and children can be seen in the following figure: (See page 9.)

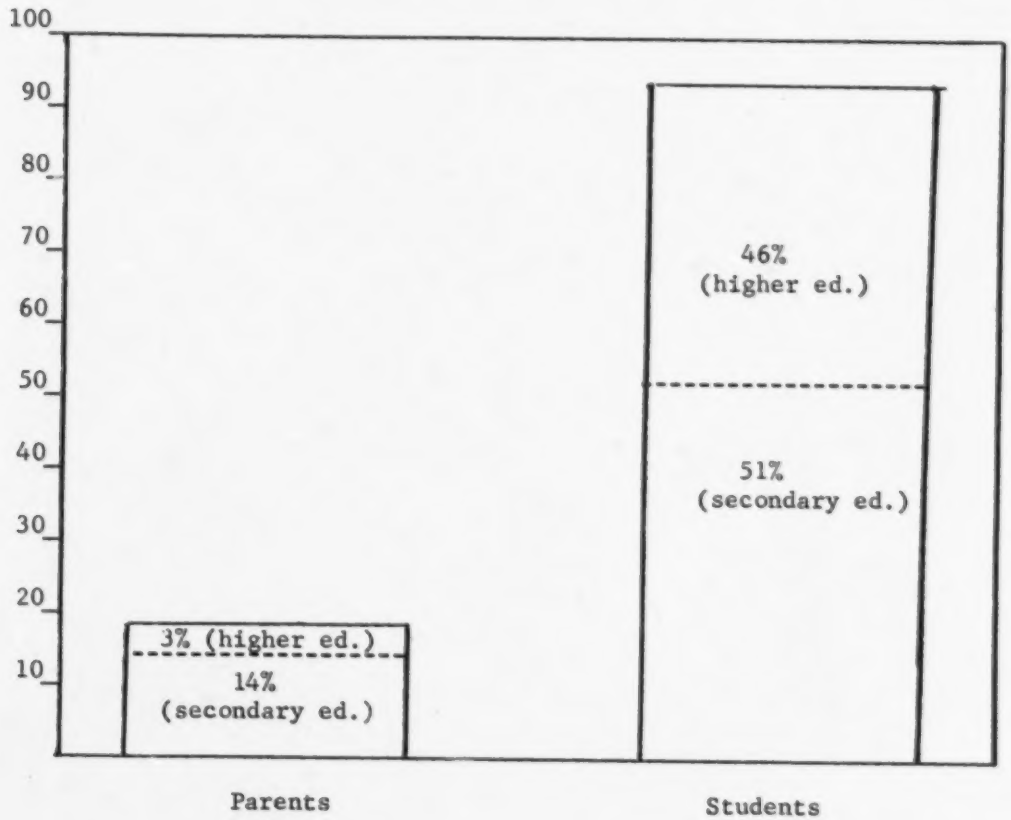
It is not surprising to find secondary students aspiring to careers demanding secondary or higher education, but we need to understand how much they aspire beyond the present level of their parents. This asymmetry may illustrate how much of a leap a country like El Salvador is making in one generation and may suggest to planners that they take stock of future opportunities for these students. These students do not, in general, seem to be aiming for the "middle-level manpower" positions that were originally thought of as the chief products of the new secondary system. If their expectations remain unrealistically high, frustration on a broad scale is likely to result.

A question of interest, therefore, is the apparent effort of television and the new curriculum on aspiration for further education and career goals. The pilot classes with television showed higher educational, career, and salary aspirations at the end of the school year than at the beginning. The increase was greater than that of traditional classes, although these increased also. A random sample of ninth graders at the end of their Plan Basico schooling showed equally high aspirations as did seventh graders. If we assume that

FIGURE ONE

Parents' occupations vs. students' aspirations:

Percentage of parents' current occupations and students' career aspirations for which secondary or higher education is demanded



aspirations are rising among Plan Basico students of the first year, we need to watch whether an improved counseling program and better career information will help reconcile student expectations and the job opportunities the country will be able to provide in the next few years. This problem will bear continued study.

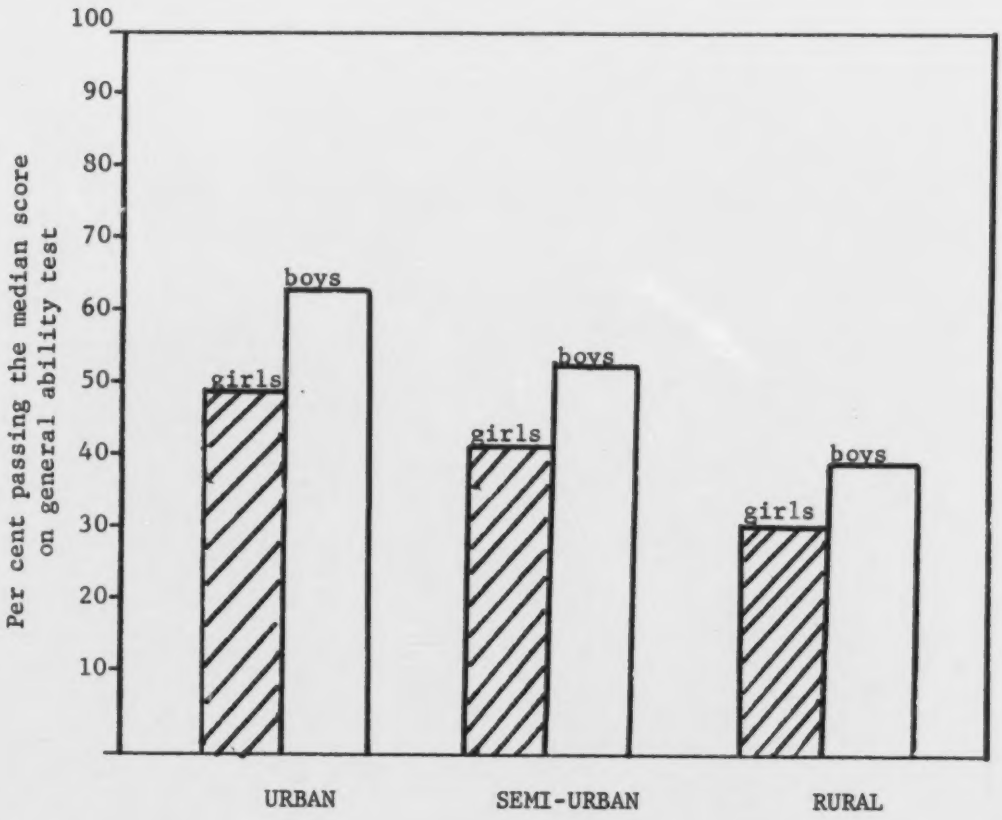
Distribution of abilities among students

During the first year of research we collected basic data on the backgrounds, demographics, and abilities of the student population whose learning was to be measured. As a part of this effort, we administered, apparently for the first time on a broad scale in El Salvador, tests of general ability and reading skill. These tests show that students in urban schools score higher than those in rural schools and, whether urban or rural, boys score higher than girls. In general reasoning and quantitative ability, for example, the following distributions were recorded for our sample: (See page 11.)

The rural-urban difference has been found in many other countries, and relates, among other things, to family factors as well as to educational opportunity. The better-educated and wealthier parents are more likely to live in the city than the country, and their homes are likely to provide more opportunity to read, more stimulus to study, than homes where the parents are poorly educated and unable to afford books, magazines, television sets, and other such learning opportunities. Furthermore, the better-trained teachers are more often found in city schools. And the presence of professional men, large

FIGURE TWO

Distribution of general ability scores of students according to level of urbanization and sex



businesses, the printed media and a host of other stimuli that cities provide, all stimulate a child toward higher career aspirations.

The male-female difference, however, has not generally been noted in previous studies. In the United States, for example, up to high school level, girls generally do as well or better than boys on tests of this kind. Why, then, should boys so far excel girls in tests of ability in El Salvador? Since innate abilities probably average out over the population, the difference between male and female abilities that appears in grade 7 must be the result of exposure to culture and schooling. The culture of El Salvador expects different things of boys than of girls, and encourages them to perform better on tests which measure their progress toward their expected cultural roles. From our evidence, schooling seems to reinforce the male dominance of the culture.

One of the interesting questions to be answered in the next years of the research program is whether the new curriculum, by improving the training of all teachers and sharing television instruction equally with all schools, will lessen the ability differences we have noted. We might hope that urban-rural differences would be lessened over the next few years and a greater equality of opportunity made possible. It is a great deal to ask of the new educational system that it should have any effect on the cultural pattern that provides greater incentive for boys than for girls to develop their abilities to learn, and in any case these effects would not be quickly apparent. But yet it will be interesting to observe whether the wider

availability of television, inevitably bringing examples of what women have accomplished in education and careers in other countries, will make any difference in the sex roles that seem to be reflected in the ability scores.

How much are the students learning?

No standardized tests or grade norms are available in El Salvador; as a matter of fact, very little centralized testing of any kind was done until this last year. Multiple-choice, objective tests, 50 items each, were constructed by the Educational Testing Service, of Princeton, New Jersey, to fit the goals and content of three of the five principal subjects offered in the seventh grade. These were natural science, mathematics, and social studies. The two subjects for which tests were not constructed were Spanish and English languages. The three sets of tests were given at the beginning and the end of the 1969 school year to the 32 pilot classes using the new system and to a sample of 12 classes using the old one, and to four control classes which made use of every tool of the new system (retrained teachers, new curriculum, new guides, and so forth) except the instructional television. Both public and private schools, and urban and rural schools, were included in the sample. The total number of students tested was 1,814 at the beginning and 1,689 at the end of the school year. Comparing the 28 public school ITV classes and the 12 traditional classes, we find these overall test scores:

TABLE TWO

Mean Scores in Three Subjects Before and After the First Year: Television and Traditional Classes

Subject	New System Classes	Traditional Classes
Mathematics		
Mean score, February	11.79	12.22
Mean score, October	18.06	14.17
Gain	6.27	1.95
Social Studies		
Mean score, February	26.55	26.82
Mean score, October	33.77	29.43
Gain	7.22	2.61
Science		
Mean score, February	17.82	18.47
Mean score, October	23.79	19.81
Gain	5.97	1.34

(Differences between classes on gain scores are all significant beyond the .001 level.)

The gains in each case are large and encouraging. Because of the absence of grade norms, it is impossible to interpret the gains in terms of school years. The best comparison we can make is with the traditional (old curriculum, no television) classes. Here is is evident (from the preceding table) that the gains are much less than in the new system classes. Yet this comparison is unfair because some of the subject matter of the new curriculum was not taught or given equal emphasis in the old curriculum. For example, the new curriculum includes some elements of "modern math," and students in the old

curriculum could hardly be expected to know much about sets or number theory. Therefore, we separated out the questions that seemed to be covered only in the new curriculum, and first compared the new and traditional classes on the questions that were common to both curricula; then on those keyed to the new curriculum of the television classes and, finally, on both sets of questions combined. Here are the results:

TABLE THREE

End-of-year Achievement Differences:
Television and Traditional Classes

This table gives average per cent additional correct answers by TV students as compared to traditional students.

a) questions common to both TV and traditional curricula

b) questions keyed to the TV curriculum

c) all 50 questions on each of the three tests

Subject	Common Questions		TV Questions		All Test Questions	
	No. of questions	% more by TV	No. of questions	% more by TV	No. of questions	% more by TV
Mathematics	30	25%	20	28%	50	27%
Social Studies	22	18	28	12	50	15
Science	18	15	32	24	50	20

We found that the students in the new system showed about 20 per cent higher end-of-year scores, on the average, than did students in the traditional classes when measured on questions equally appropriate to both groups. This was clearly true of mathematics and social studies. We are less confident of the comparison in science, where the

new content is so different that comparisons are difficult. But for mathematics and social studies, at least, and probably for science also, we can say with some confidence that significantly more learning is going on under the new system, in the classrooms with television, than under the old system, in the traditional classrooms.

This is especially noteworthy, because in each case the traditional classes had a slight advantage in scores at the beginning of the year. The difference lay in how much was learned during the year.

We made an attempt to separate out the learning that resulted from television from that which resulted from the other elements in the new system -- for example, the retraining of teachers, the revised curriculum, the new guides, and so forth. In other words, what was television contributing to the new system? The results were rather inconclusive.

This we tried to do by means of an experimental design, in which students in each of four schools were supposed to be assigned randomly either to a class with television or a class without television. Every other aspect of the class was to be the same: both types had retrained teachers, both used the new curriculum, the new methods learned in retraining, the new materials, and the like. Each class was given the objective achievement tests at the beginning and the end of the school year.

When we compared the four classes with, and the four without, television, however, we found that something had apparently gone wrong with the random assignment, and the television classes were significantly

higher in general ability (although, for some reason, not in reading ability) than the classes without television. Furthermore, we found that at least one of the teachers of mathematics and science in the non-television classes seemed to be an unusually effective one, and one such teacher among eight classes can make a considerable difference in average scores. We could allow statistically for the difference in abilities, but not for the difference in teachers (for whom random assignment or exchange of classrooms proved not to be acceptable). When we compared the test results, this is what we found:

TABLE FOUR

October Test Scores: Television and Non-Television Control Classes

	Unadjusted figures		Adjusted figures	
	With TV	Without TV	With TV	Without TV
Mathematics	17.7	17.2	17.4	17.5
Science	22.4	23.3	22.0	23.7**
Social Studies	33.1*	29.8	32.7***	30.2

*Significantly different in favor of the classes with TV
**Significantly different in favor of the classes without TV
***Significantly different in favor of the classes with TV

We have shown only the end-of-year scores, because there was almost no difference in scores at the beginning of the year.

Without statistically adjusting for ability differences then, one course (social studies) shows a significant advantage for the television group; the other two courses show no significant difference.

When the ability differences are taken into account, one course (social studies) still shows a significant advantage for the television group; one (science) for the non-television group; and one (mathematics) shows no difference.

No judgment as to the contribution of television can be made on the basis of these results. Too many variables may be biasing the figures. We have mentioned two of them -- ability differences and teacher differences. There were reports also that the teachers and students in the non-television classes were working especially hard because they felt discriminated against and wanted to "show them." We shall repeat the experiment in the second year, hopefully with more controls over the variables. But a complete answer to the question of what television contributes as distinct from other elements, to a revised system like that of El Salvador must wait for a great deal of sophisticated and detailed research. Meanwhile, a reasonable working hypothesis is that television contributes more to some subjects than others, more to certain parts of a course than to others, and more to a class that does not have an extraordinary classroom teacher than to one that does. And that television, when used effectively, works as part of a teaching-learning system, interacting with the other components.

Some cognitive measures

No test of substantive learning, even one made by as expert an organization as the Educational Testing Service, is likely to

measure completely what is learned in the classroom. Among other things, the student learns attitudes and values, new patterns of thinking, socially useful skills and understandings, and the like. Therefore, we have tried to measure attitudes (see following sections), we have given three different tests of cognitive abilities, and we shall try to build in more measures as the project goes on.

We gave two different tests of equivalence -- meaning the ability of the child to detect similarities between things and indicate these similarities in concepts verbally expressed. One test consisted of a set of 42 pictures of common objects. The child was asked simply to pick out pictures that seemed to belong together; then was asked <u>why</u> they belonged together. This process was repeated for ten trials for each child and thus a good measure of the child's ability to group and express the basis for his grouping was gained.

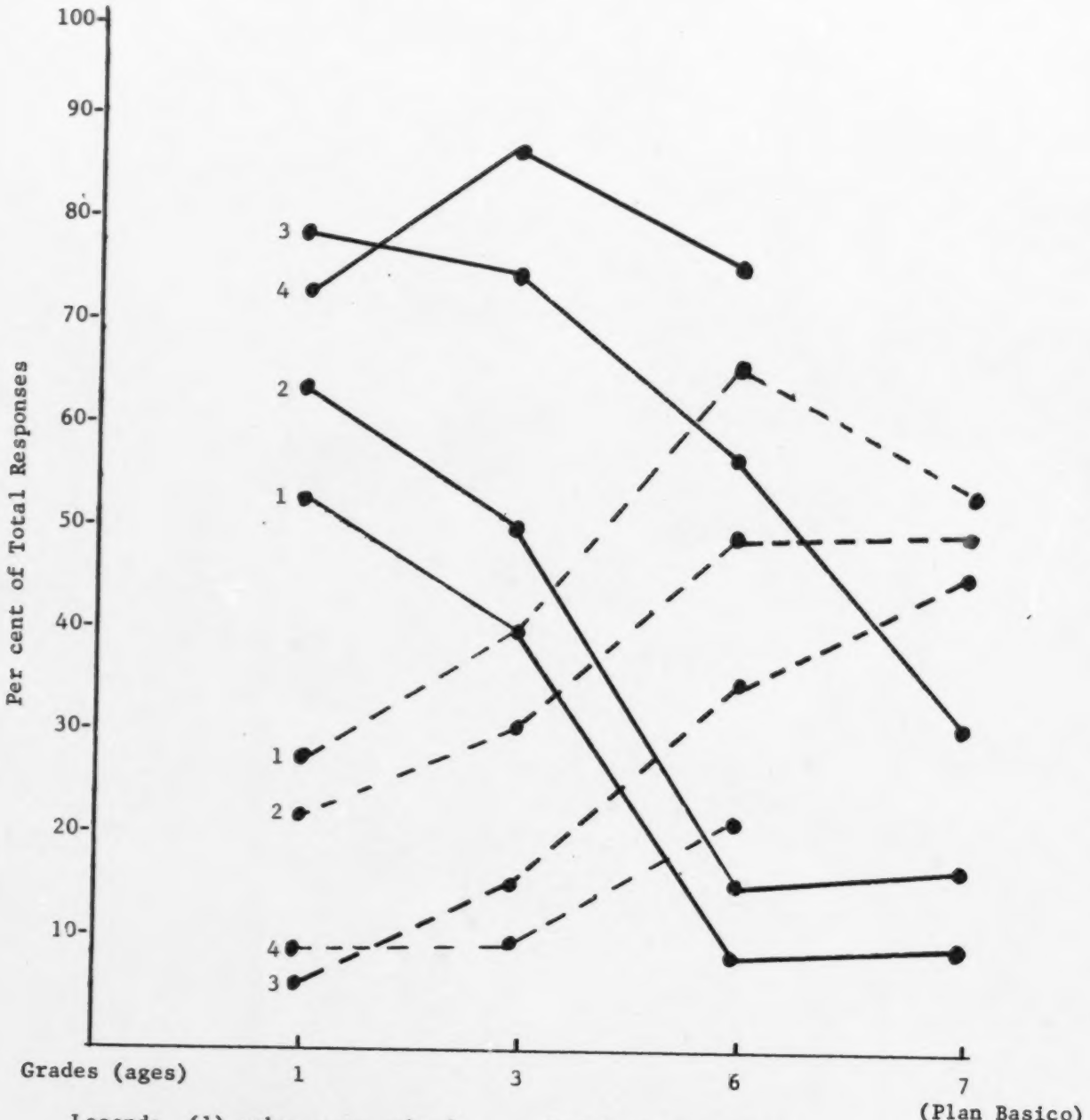
A second test used words rather than pictures. The child was given a pair of words and asked in what respect they were similar. Then a third word was added, and he was asked how the third was different from the first two, then how all three were the same. This went on until the child was working with seven different words, trying to fit them all into a single all-inclusive concept. This is, of course, a rather harder test than the one with pictures, but results were very nearly the same.

If we look at figure three, we see the results of the picture test. Two kinds of answers encompass most of the reasons children give for grouping things. Most similarities were perceived either

FIGURE THREE

Functional and appearance reasons for grouping

on the picture equivalence task



Legend:
(1) urban poor school
(2) urban private school
(3) rural school
(4) rural illiterate non-school age groups

Modes of grouping:

appearance _____

functional ----------

in terms of appearance or function. That is, the child might say that a group of pictures or words represents things that are green, or round or heavy -- appearance. Or he might say that the words or pictures represent objects that one can eat, work with, or play with -- function. We notice that with age the use of functional reasons increases for most of the groups and appearance decreases. This is as it should be since the functional reason is generally a more abstract one and calls for a type of classifying skill that one needs increasingly in school. The development in the direction of the more abstract type of thinking is found in association with age, but a look at the illiterate group indicates that age alone is not the key and that we should more likely find it in the schooling experience.

Our design called not only for variation over age (in order to study developmental trends among Salvadoran children and compare them with children of other cultures) but over groups with different schooling and urbanization and social backgrounds. The figure reveals that most of these factors were important to how the child develops his grouping ability; city children were ahead of rural and rural ahead of illiterates. These findings fit with the findings in the ability and achievement testing that were described in previous sections. The patterns, then, are common over a number of cognitive areas and it will be the task of research to see whether the new instructional system will be able to alter these patterns. Will it increase the rate of development for all children? Will it speed up the more abstract thinking ability in rural children? What effect

will increased information have on the classification behavior of illiterates if they get even a year in school?

The third test was one of ability to suggest alternative uses for objects under various conditions. "How many ways can you think of to use this object?" they were asked. The object might be, for example, an empty Pepsi-Cola bottle or an old newspaper. They were scored both on the total number of different uses, and the number of non-ordinary uses. The test thus measured one aspect of verbal fluency as well as cognitive flexibility or creativity.

Two schools from the same urban slum were chosen for this study, one representing the traditional rote teaching and learning methods, the other an experimental school that stresses modern active methods of learning and non-rote teaching. We found that students from the same slum going to the experimental school did significantly better than peers in the rote school on both measures of fluency and flexibility. Although boys and girls studied together in the same classes in both schools, evidence showed girls falling behind boys in flexible thinking at the end of primary in both schools.

We should note here that this experimental school has produced some significant changes in the six years of its existence. The emphasis has been on changing the teaching methods, getting away from the rote system that is largely verbal, rigid, and memory-centered, to a method of learning that provides children with more information sources in books, games, and experiments, and provides strong basic skills in reading and mathematical thinking. The students at the

experimental school are not specially selected from a large geographic area but are chosen from an urban slum where families are poor and opportunity for schooling generally meager. The results of these cognitive tests and other forms of research conducted at the school during the year indicate that learning and achievement in this school are not related to family background factors in the same way that is so important in predicting achievement in most other schools. The teaching method promoted in this school is a hopeful sign for the kind of instruction that the educational reform is promoting through television. We will be studying the effects of this new kind of national instruction in the years to come to see whether it can promote cognitive fluency and flexibility as well as increased achievement.

Some notes on classroom interaction

We gave considerable time during the first year trying to develop a reliable instrument for describing the interaction that actually takes place in different classrooms, so as to be able to see whether the new system teaching helped promote a different learning climate in the classroom. This instrument would necessarily have to be simple enough to be used by supervisors, because it would be prohibitively costly to put highly trained researchers into the number of classrooms that would have to be observed in El Salvador. This task has been greatly delayed because the whole second-year class of supervisors, trained to use such an instrument, was

transferred to other assignments, for reasons related to the politics of the school system. However, the work goes on at a low level, and will pick up shortly when a new class of supervisors becomes available.

In the meantime, it may be useful to report some less systematic observations by supervisors and members of the research staff.

It is clear that significant changes have taken place with the introduction of the new system. The typical Plan Basico classroom, as it has existed in El Salvador, is a rather dreary place both visually and intellectually. Aside from a single blackboard, its walls are generally bare, except for an occasional calendar, religious picture, or map. Seated in rows, the students listen while the teacher lectures or reads from a textbook. When they are not listening, they usually copy dictation or résumés. When the teacher asks questions, they are generally memory questions. There is little encouragement for a student to offer an opinion, discuss, or even ask questions. There are exceptions, of course, particularly in the urban schools; but this has been the mode. The students have apparently been thought of largely as empty vessels which the teacher must fill from the subject matter of the official curriculum. In a sense, of course, this problem is equally great in many U.S. classrooms where tradition prevails.

This is changing, spurred by the educational reform movement. In the classes with television, walls are becoming display areas for

student projects -- leaf collections for science, social studies maps, number charts for mathematics, pictures representing new words in English, and so forth. The classroom teacher is no longer the single source of information; the teleteacher shares that responsibility with him. Dictation and résumés are largely being replaced by workbooks, which include basic information as well as problems and exercises; and these in turn encourage the students to get together in small groups, discuss the problem, and try to work out possible solutions -- asking the teacher's help or advice when they need it. The teacher himself has more incentive in the new system to vary his role and his methods of teaching. He has been retrained, given greater confidence in his ability to handle the subject matter, furnished with a guide that helps him prepare students for the television and also to suggest activities that involve students. Some instances have been reported when the classroom teacher feels himself in competition with the teleteacher and works hard to show that he is as competitive and creative as the man on television. This is a healthy kind of competition, for the sake of the students.

This seems to be the trend. It has not yet happened throughout the system, or in all classrooms. But it is an encouraging trend.

Attitudes toward the new system in general and ITV in particular

Some previous projects have reported unfavorable student attitudes toward being taught by television. Many have reported teacher resistance to the use of television in the classroom. For

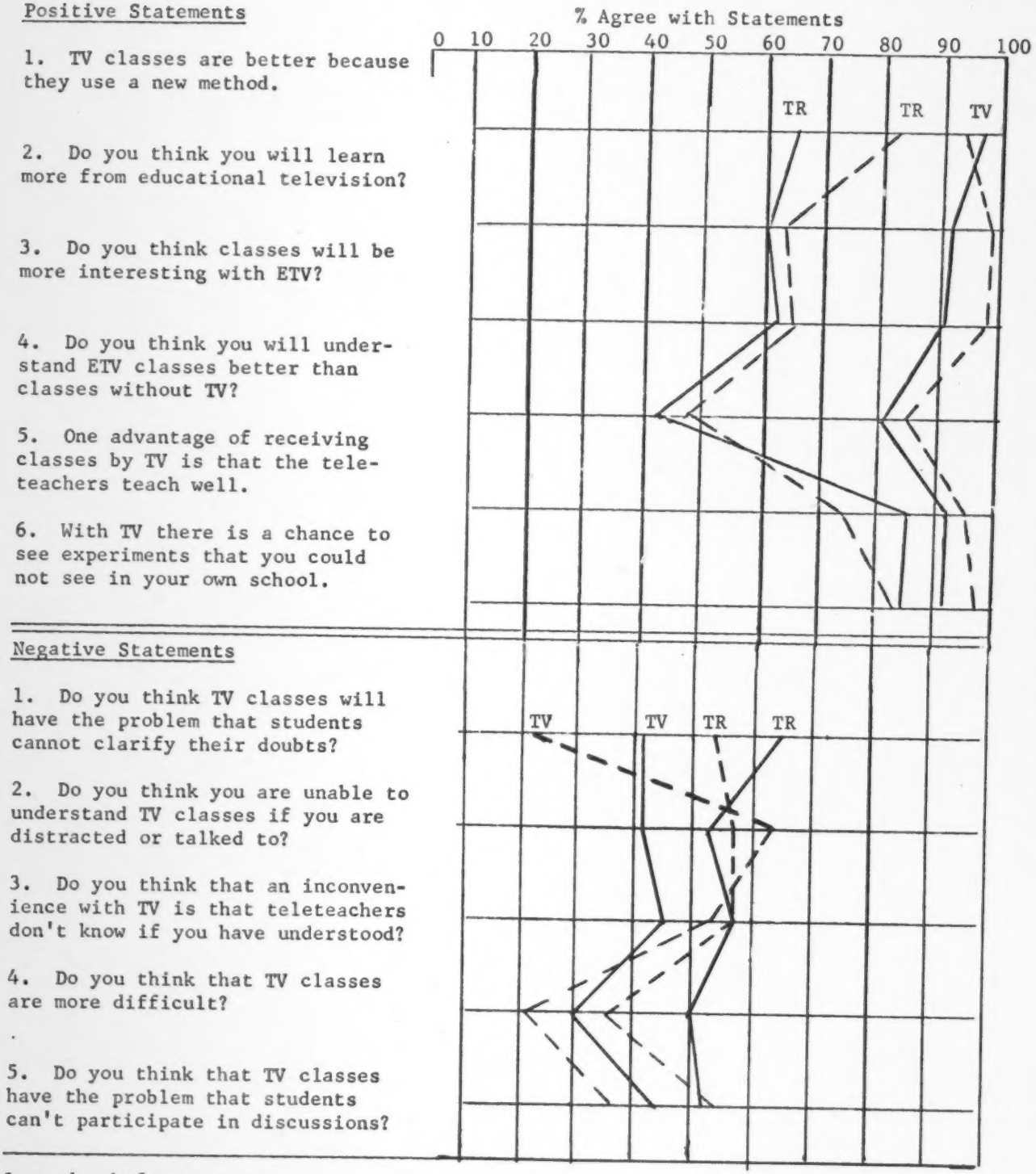
these reasons, a great deal of time was spent in the first year measuring attitudes toward the new system and its television. Eight separate studies of El Salvador's teachers were made during the year, along with large studies of new and old system students at the beginning and the end of the school year, and a small sampling of parental opinions toward what was happening in the schools.

The results should be highly gratifying to the directors of the educational reform. The attitudes are about as favorable as they have been found to be anywhere, a generally favorable reaction is found throughout the different groups of students and teachers. Attitudes become, if anything, more favorable after a respondent has had experience with using television.

As we see in Figure four, students in the seventh grade just beginning to use ITV were anticipatory, highly favorable toward the idea of being taught by television. At the end of the year, their attitudes on positively worded statements remained at least as favorable as at the first of the year. They were more favorable than were students in traditional classes, who had no experience with being taught by television and may have been a bit envious. Even in the case of these traditional classes, however, attitudes were somewhat more favorable at the end of the year than at the beginning, suggesting that they may have heard good reports from the television classrooms. Negatively worded problems followed a less regular pattern but revealed that television students found there were problems with distraction during lessons and found the teleteacher not realizing that they sometimes didn't understand.

FIGURE FOUR

Student attitude graphs concerning television


Positive Statements
1. TV classes are better because they use a new method.
2. Do you think you will learn more from educational television?
3. Do you think classes will be more interesting with ETV?
4. Do you think you will understand ETV classes better than classes without TV?
5. One advantage of receiving classes by TV is that the teleteachers teach well.
6. With TV there is a chance to see experiments that you could not see in your own school.
% Agree with Statements
0 10 20 30 40 50 60 70 80 90 100
TR
TR
TV
Negative Statements
1. Do you think TV classes will have the problem that students cannot clarify their doubts?
2. Do you think you are unable to understand TV classes if you are distracted or talked to?
3. Do you think that an inconvenience with TV is that teleteachers don't know if you have understood?
4. Do you think that TV classes are more difficult?
5. Do you think that TV classes have the problem that students can't participate in discussions?
TV
TV
TR
TR
Legend: before measure:
after measure:
TV: Television classes
TR: Traditional classes

Teachers in the first retraining course were highly favorable to television and the new system at the beginning of their course; still favorable, but perhaps more realistic, at the end of the course. They came to see the strengths and weaknesses of television more clearly during the course, and to understand better their role in making it effective.

When members of this first retrained group went into the classroom, they were highly favorable to the use of television and maintained the same attitude throughout the year (see Figures five and six). Their attitudes were more favorable than those of the second group of teachers placed in the retraining course, who were in turn more favorable than graduates of the Superior Normal School who had no experience with television. As Figures seven and eight illustrate, however, all three groups were generally favorable, and it is doubly significant that the attitudes of the classroom teachers actually using television should be as favorable as they were at the end of a year's experience using it. If their experience in a television classroom had been negative or frustrating, this would surely have come to light in responses like the ones reproduced with the figures. The less favorable answers seem to represent rather the professional skepticism of the trained teacher than any serious objections or unfavorable experiences with television.

Our small study of parental opinions indicated generally favorable attitudes, although very little detailed knowledge of the new system.

The important fact is the absence of any apparent major disapproval of television on the part of teachers, students, or parents. Some of the favorable responses may be attributed, of course, to a "Hawthorne effect" -- pride in being first to try a new technology, and consciousness of being observed. More of the reaction, however, must be attributed to the careful retraining of teachers before they were thrown into a classroom with television, so that they could more easily handle both the subject and the method, and could anticipate the problems. In part, also, it might be due to the strong support given the new system by administrators and government. Beyond these it must reflect a generally favorable experience with television and the new role of the teacher. At the end of the year we interviewed a sample of the teachers who had been using television, in order to gather their experience and get an idea of some of the problems they had faced. There had been problems, indeed, but the general opinion was that television in the classroom was helpful, and whereas they had to work harder than in the old system they enjoyed the experiences of the new one.

It will be important to watch what happens to these attitudes when the Hawthorne effect, if any, is diluted by a second year of experience with the new system, and when large numbers of teachers come from the traditional classes and the Superior Normal School into television classrooms.

FIGURE FIVE

Graphic representation of agreement with statements favorable to TV before and after the first school year by classroom teachers

Positive Statements

1. Students learn more by TV than by teaching without television.

2. Classroom teachers improve their teaching method by observing the television teacher.

3. With television it is possible to make common exams for promotion for all schools.

4. The classroom and the TV teachers share the responsibility of teaching, but in different ways.

5. Students learn to study better by themselves when they receive classes by television.

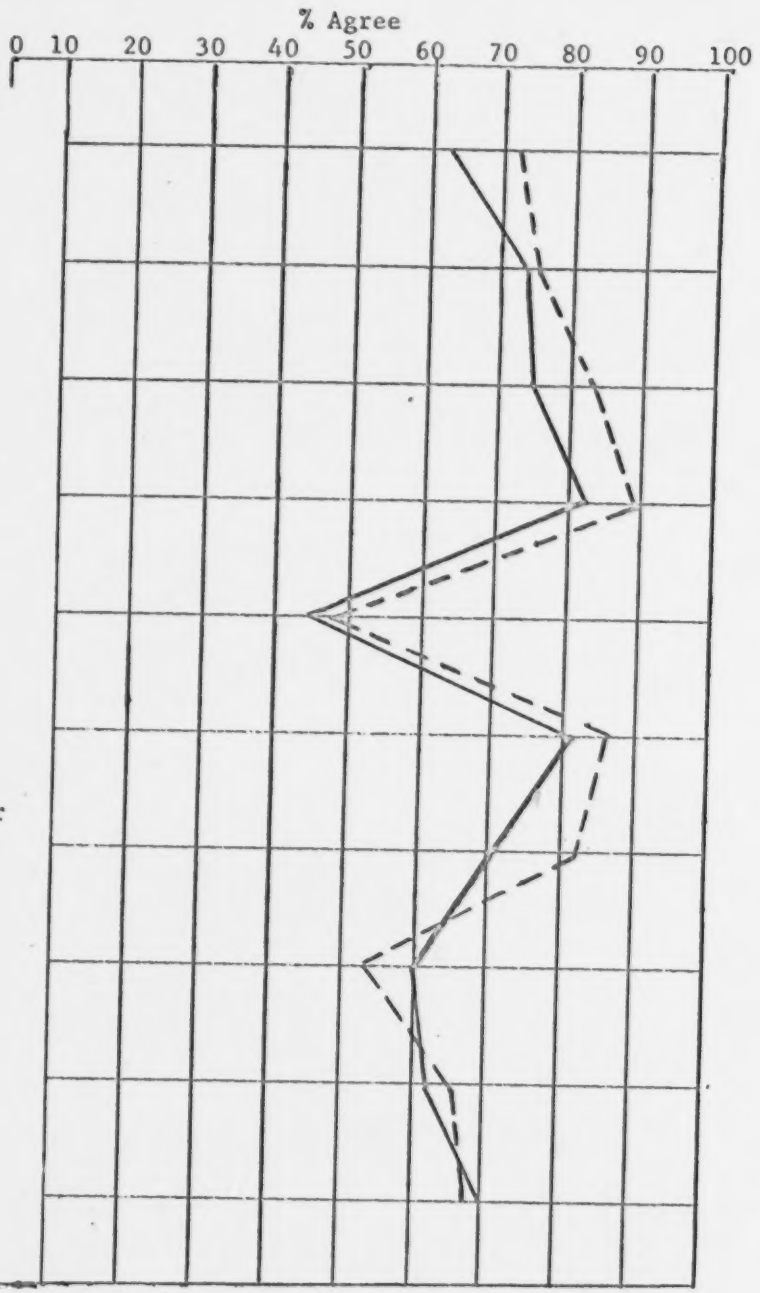
6. The talent of better prepared teachers can better be shared by schools when they use television.

7. Teachers learn to organize their schedule better with the television system.

8. Through television you can teach more during the year because you cover more matter.

9. Students are more interested in their classes when they receive them by television.

10. Television will help interest parents more in the education of their children.



Legend: Classroom group before (N=116): _____

Classroom group after (N=125): _ _ _ _ _ _

FIGURE SIX

Graphic representation of disagreement with statements unfavorable to TV before and after the first school year by classroom teachers

Negative Statements

1. It is harder to maintain discipline in class when you teach with television.

2. Classroom teachers can teach what TV programs teach if they have the necessary materials.

3. Television classes hinder personal relations between the classroom teacher and his students.

4. Television programs cover too much matter for the students.

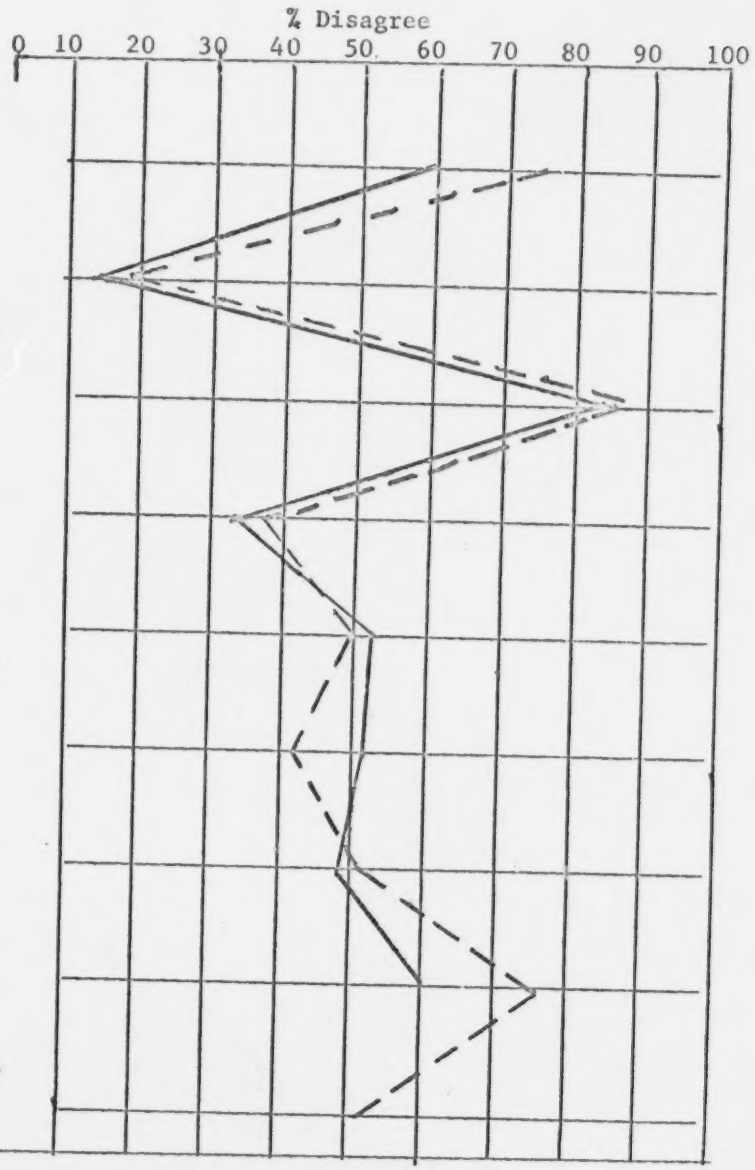
5. Television programs cannot be seen well because the technical equipment is faulty.

6. Television programs teach facts but do not teach concepts that are hard to visualize.

7. A serious problem with TV is that students can't ask questions until the program is over.

8. Teaching with television makes the students more passive in the classes.

9. The television schedule does not permit sufficient flexibility to teachers in teaching his subject. (after only)

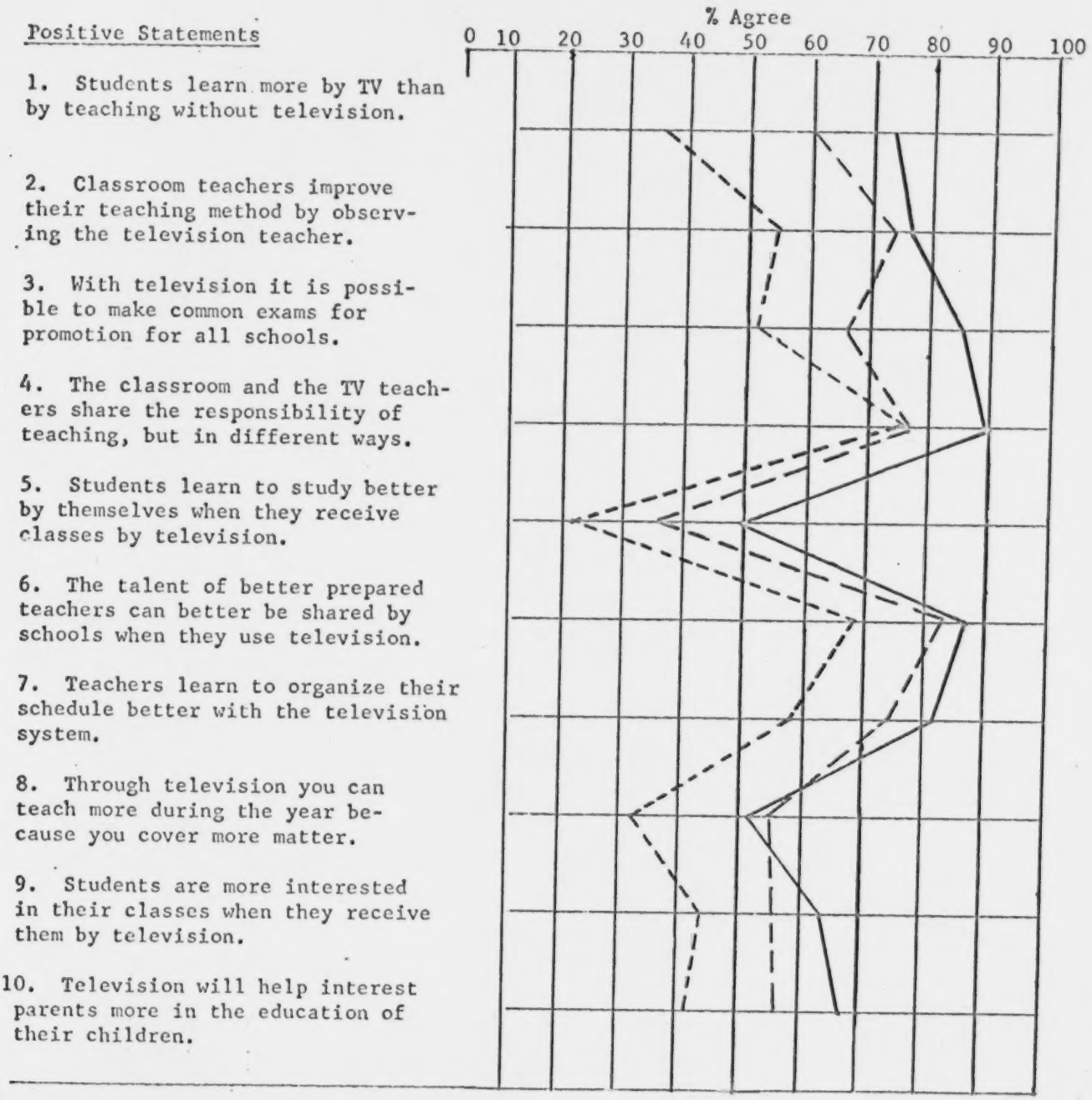


Legend: Classroom group before (N=116): _____

Classroom group after (N=125): _ _ _ _ _ _

FIGURE SEVEN

Graphic representation of agreement with statements favorable to TV on after measures by three teacher groups: classroom, retraining and Superior Normal


% Agree
0 10 20 30 40 50 60 70 80 90 100
Positive Statements
1. Students learn more by TV than by teaching without television.
2. Classroom teachers improve their teaching method by observing the television teacher.
3. With television it is possible to make common exams for promotion for all schools.
4. The classroom and the TV teachers share the responsibility of teaching, but in different ways.
5. Students learn to study better by themselves when they receive classes by television.
6. The talent of better prepared teachers can better be shared by schools when they use television.
7. Teachers learn to organize their schedule better with the television system.
8. Through television you can teach more during the year because you cover more matter.
9. Students are more interested in their classes when they receive them by television.
10. Television will help interest parents more in the education of their children.

Legend: Classroom group (N=125): _____
Retraining group(N=227): — — — — — —
Superior Normal (N=151): _ _ _ _ _ _ _ _

FIGURE EIGHT

Graphic representation of disagreement with statements unfavorable to TV on after measures by three teacher groups: classroom, retraining and Superior Normal

Negative Statements

1. It is harder to maintain discipline in class when you teach with television.

2. Classroom teachers can teach what TV programs teach if they have the necessary materials.

3. Television classes hinder personal relations between the classroom teacher and his students.

4. Television programs cover too much matter for the students.

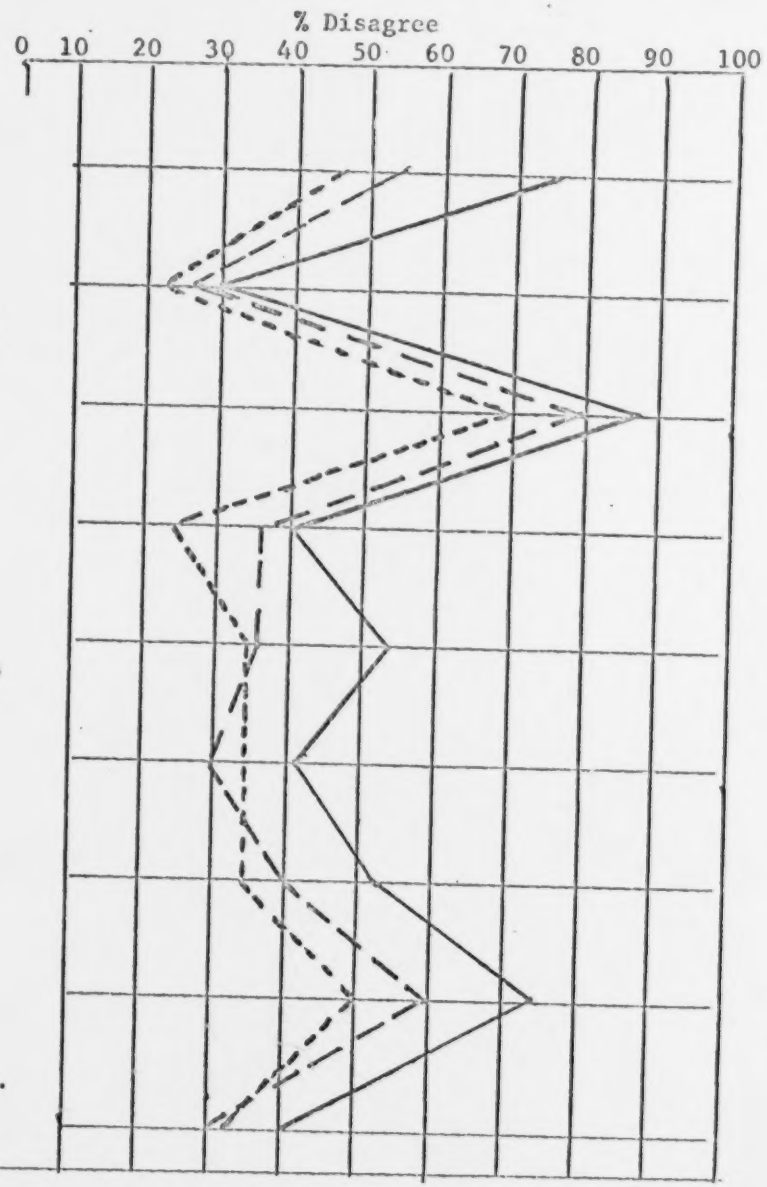
5. Television programs cannot be seen well because the technical equipment is faulty.

6. Television programs teach facts but do not teach concepts that are hard to visualize.

7. A serious problem with TV is that students can't ask questions until the program is over.

8. Teaching with television makes the students more passive in the classes.

9. The television schedule does not permit sufficient flexibility to teachers in teaching his subject. (after only)



Legend: Classroom group (N=125): _____
Retraining group(N=227): — — — — — — —
Superior Normal (N=151): _ _ _ _ _ _ _ _ _ _

The history of the educational reform

The history of educational reform in El Salvador cannot be written well until more time has passed and longer perspective has been gained. The record will some day be very interesting, however, to other countries that are thinking of following a path to educational development. We are therefore collecting data on the timing of administrative actions and preparatory activities, taping interviews with some of the key personnel, and collecting "critical incidents" as indications of problems that have arisen and the way they have been solved.

One observation that emerges clearly from the data is the amount of preparatory activity that had to occur before any of the educational changes actually affected students. The history of instructional television in many countries has been one of frantic last-minute concentration on getting a broadcast system installed and operative, to the neglect of other educational preparations. If El Salvador avoids some of the problems many other countries have had with instructional television, it will be in no small part because the total educational system requirements were seen early enough to do something about them at the same time as the hardware requirements were being met.

The first televised class in the new curriculum was broadcast in El Salvador in mid-February, 1969. Nearly three years before this time the use of instructional television was already being discussed in the country. A leading proponent of this innovation was Lic. Walter

Beneke, a former diplomat and businessman who had seen television used effectively in Japanese schools among others, and who later became Minister of Education. In 1966, for instance, Lic. Beneke had headed a private commission to study the possibility of using television in education. Three studies were subsequently made by Unesco, by a Japanese team, and by a World Bank group. The focus was primarily on hardware in these early reports. Shortly after the election of President Sanchez Hernandez in 1967, the President met with other Latin American chief executives at Punta del Este and heard President Lyndon Johnson express the interest of the United States in assisting one or more pilot projects using instructional television in Latin America. President Sanchez told President Johnson that El Salvador was already thinking along those lines, and thus began a continuing United States interest in the Salvador program, which was expressed through the Agency for International Development.

Television had not only been discussed but studied during previous years. In May, 1967 (B day minus 20 months), a final study sponsored by AID and conducted by the National Association of Educational Broadcasters gave a more complete picture of the options. The favorable recommendations of this study team provided the impetus for AID's final commitment to the project.

In July, 1967, Mr. Beneke was named Minister of Education. In January, 1968 (B day minus 13 months), AID, prior to writing a loan document, sent a team to make a thorough three-months study of the situation. By early spring of 1968, the Minister had appointed a

Director of Instructional Television. By April, 1968 (B Day minus 10 months), the new ITV director was at work with a small crew on the problems of programming and production. During the spring months of 1968, negotiations were going on with AID for grants to support the purchase of studio equipment and receivers, and to pay for advisers and other support. Following the AID loan study, a proposal for a $1.9 million dollar loan to cover major expansion in television facilities was drawn up and approved in June of 1968 by the U.S. Government. Negotiations have been long and protracted on this loan; at this writing, the expectation is that it will soon be passed by the Salvador Legislature and will be available for the project within a few months.

In July (B Day minus 7 months), the first of 12 technical advisers supplied by AID to assist in curriculum revision, television production, utilization, and teacher training, arrived in El Salvador. For the next eight months, preparation for the educational reform went forward simultaneously in all the major lines of development: curriculum, teacher retraining, installation of equipment, production of programs, training of supervisors, and evaluation.

A Commission on Plans and Programs was appointed in the summer of 1968, began intensive work on the seventh-grade curriculum, then turned to the other levels of Plan Basico and to the primary school curriculum. The seventh-grade plan was completed in the fall, along with formats for teachers guides and student workbooks, and turned over to the production staff, which was by that time working in a new

studio at the San Andres Normal School (the studio was inaugurated on B Day minus 5 months). Experimental programming was going on, and teams of subject matter specialists, producers, and teleteachers were beginning to turn out programs and classroom materials. By this time, film and graphic arts departments were functioning. A production course was held in the autumn, with 30 candidates in attendance. Approximately 100 persons were on the ITV staff by the end of 1968 (it was further increased to 165 by the Fall of 1969).

Meanwhile, preparation for teacher retraining had gone ahead. A general plan was prepared in the summer of 1968, and 120 teachers began a 10-weeks course in November, 1968 (B Day minus 3 months). From this course came the teachers who participated in the first year of the new curriculum, and also the first group of supervisors. Preparations were made also to receive 260 teachers for a full academic-year course, beginning in March of 1969. In the autumn of 1968, a small portable videotape recorder was purchased for San Andres Normal School to provide micro-teaching practice for the teachers in retraining.

Classroom remodeling for the use of television was begun in the autumn of 1968, and six supervisors were chosen from the first retraining course and given special preparation for their new advisory duties. Beginning in September of 1968, a research and evaluation staff became active, preparing tests, drawing samples, studying the effects of the first teacher retraining course, and obtaining baseline measures, following the general lines of a research planning session

held at Stanford (about B Day minus 6 months). Shortly before that a contract for evaluation had been signed with the Academy for Educational Development.

All these lines of preparation converged at the beginning of the 1969 school year, in February, when the new curriculum was put into use for the first time, and when for the first time Salvadoran seventh-grade students began to receive about fourteen 20-minute televised programs a week in science, mathematics, social studies, Spanish, and English. The typical television class hour included 10 minutes of preparation by the classroom teacher, 20 minutes of television, and 20 minutes of follow-up activity and practice also conducted by the classroom teacher. In all courses except English, one to three class hours per week were left entirely to the classroom teacher without television: one hour each in science and mathematics, two hours in social studies, three in Spanish. In the 1970 school year, a similar schedule is being followed in both seventh grade (for 80 per cent of public schools) and in the pilot classes for eighth grade.

This is not intended to imply that all preparations for and beginnings of the new system were without problems. Indeed, an analysis of some of the problems may prove to be one of the most useful products of these records. But it seems advisable to do this when a little more perspective has been gained. Nor is it intended to imply that the original plans were not changed in many cases during the preparation and trials. One example of such changes is what

happened to the program of curriculum revision. This began as a relatively superficial examination of content areas, without attempting to relate the offering to national goals, to developments in teaching methodology, or to classroom activities and materials of instruction. In other words, the curriculum was conceived in the classical way as a content syllabus. When the television programs began to be seen on the air, however, some serious dissatisfactions with what ITV was projecting led to a new approach toward curriculum: a consideration of objectives in terms of behavioral goals for students, and of national needs, and a concern with method as well as subject matter of teaching. This was a largely unforeseen effect of television on the rest of the system, and it may ultimately be one of the most significant effects.

A note on the research

The research summarized in this report will be presented in greater detail in a technical report of the first year's research, to be published by the Institute for Communication Research about July 1, 1970. Here it may be useful to set down a few notes about sample size and research instruments.

The basic sample of seventh-grade students, which was used for the tests of learning, ability, and attitude measures at the beginning and end of the school year was as follows:

Type of Class	Public schools	Private schools
New system, with ITV	820	185
New system, without ITV	132	--
Old system (traditional)	372	--
	1,324	185

Total = 1,509 (N.B. This total is less than those cited on page 14 because only cases with complete before-after data were considered here.)

The basic sample for the cognitive studies was randomly chosen in the following proportions:

	Picture Equivalence	Word Equivalence	Alternative Uses
First grade	80	60	40
Third grade	80	60	40
Fifth grade	--	--	40
Sixth grade	80	60	--
Seventh grade	80	80	--

The sample of teachers tested at the beginning and end of the first retraining course totaled 78. Teachers in the second course who were similarly tested numbered 256. Measures of attitudes were obtained also from teachers and administrators in all of the classes in the student sample listed above; these numbered 116 and 125 at the beginning and end of the school year. The sample of parents, randomly chosen, whose attitudes toward educational television was sought, numbered 49. The random sample of ninth-grade students was 466.

Fifty-item objective tests were constructed by the Educational

Testing Service of Princeton, New Jersey, on the basis of the new curriculum to measure learning in the seventh grade. All attitude and aspiration together with background factors measures were constructed as a part of the present project by members of the research staff. Two of the cognitive tests, modified in each case for a Latin American audience, were derived in part from Bruner, et al, Studies in Cognitive Growth (New York: Wiley, 1966). Tests of general ability and reading were obtained from Guidance Testing Associates of Austin, Texas, and were titled in Spanish, Prueba de Habilidad General and Prueba de Lectura (level three was used in 1969, level four will be used for both years in 1970).